



Patent Application of  
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**ANGULARLY ADJUSTABLE TREE STAND**

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**Related U.S. Application Data**

This application is entitled to the benefit of Provisional Application Ser #  
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This invention uses all applicable patent features and claims found in my prior  
Patent No. 6,010,108 01/04/00 Welzen, but does not claim them.

**References Cited**

**U.S. PATENT DOCUMENTS**

6,010,108 04/2000 Welzen  
4,408,415 10/1983 Davis  
5,845,890 12/1998 Earsley; et al.  
4,913,395 03/1990 Juhas  
5,161,768 11/1992 Sarabin  
5,388,799 04/1995 Keefe  
5,114,113 05/1992 Krinner  
4,571,882 02/1986 Capen  
4,156,323 05/1979 Scheffler  
5,249,772 10/1993 Montie Jr.  
6,129,325 10/2000 Niklas  
5,209,450 05/1993 Grapes  
5,350,149 09/1994 Evans; et al.  
5,375,808 12/1994 Roy  
5,522,177 06/1996 Davis  
4,796,382 01/1989 Anderson  
4,381,621 05/1983 Eby

## **ABSTRACT**

This invention uses adjustable features for mounting a Christmas tree, other plants, bushes or a flag or similar banner pole in a vertical alignment. A pot is nailed securely to the bottom of the tree trunk. The tree is inserted into a cover, which fits over a wide bowl. The cover has a central hole with sloping inward sides to accept and guide the tree with attached pot. The tree with pot is placed into the bowl, which captures the lower rim of a pot. This bowl acts as a water reservoir. It has a convex spherical bottom that mates with and contacts a lower base member, which has a slightly smaller radius concave upper surface. One slides the bowl on the base to make the tree stand vertically. The pot holds the tree and transfers side loads into the cover, which in turn transfers these forces to the bowl which resists them by contact with the spherical surface of the base which transmits these loads unto the floor surface.

## **BACKGROUND—FIELD OF INVENTION**

This invention relates to Christmas tree stands, specifically to the simple manner of preparing the tree by the use of a pot nailed to the tree. The tree is then easily installed into the stand. Making the final adjustment of the tree to stand up straight every time is quickly and simply done. One slides the bowl with the pot and tree, on the spherical matching surface of the base. The bowl of the stand holds sufficient water to last the entire season, thus keeping the tree green and reducing the fire hazard. It is easy to take the tree down at the end of the season and to empty the residual water in the bowl by simply pouring it into the sink, toilet bowl or tossing it outside. The tree lot personnel can install the pot and all the homeowner has to do is fill the bowl with water, put on the cover, set the tree into the bowl and slide the bowl in the proper direction to straighten the tree.

## **BACKGROUND-DESCRIPTION OF PRIOR ART**

Initially tree stands consisted of two crossed boards. The tree bottom was nailed into the boards. There were no provisions for a source of water. Later a plastic bowl was placed on the boards and the tree bottom was nailed through the bowl. A soft mastic or waterproof roofing material was placed between the bowl and the boards to prevent water leakage. The tree was straightened by loosening the nails on the tilt side and the tree straightened. It was difficult to get the residual water out of the bowl at Season's end. The bowls occasionally leaked. The bowl, cross boards and tree were discarded at the end of the season, the cost of the bowl and boards was not recoverable.

Another design used a small bowl with a spike at the bottom, a metal ring went around the top of the stand and four drop hammered metal legs were held by this ring. To support the tree, four opposing screws were turned against the tree trunk. The tilt of the tree was adjusted by loosening one or two screws on one side and tightening one or two screws on the opposite side. This was extremely difficult to do since one had to be down low on the floor. It really required two people, one to hold the tree up straight and one to tighten the screws. The bowl didn't hold enough water and the cat used the water as its own private drinking source. The screws were difficult to adjust properly and the stand could only hold small trees.

A number of tree designs use a swivel principle to get the tree to stand up straight. All of these use complicated mechanical means of holding and adjusting the tree trunk. They work primarily for smaller type trees and all do not hold enough water.

A three rebar welded legs with a center spike, which is inserted into the bottom of the tree, has been in use. A plastic bowl rests on top of the rebar. The plastic bowl has a center hole in the bottom with a rubber grommet attached. The rebar spike is pounded through the grommet and hole in the bottom of the trunk of the tree. The tree trunk must be cut absolutely straight across perpendicular to the centerline of an upright tree, since the trunk bottom rests on the bowl and top of the rebar. The hole that is drilled into the tree must be drilled absolutely in line with the centerline of a straight upright tree to accept the spike. The spike is partially serrated with horizontal grooves to hold the tree firmly. If the hole is drilled crooked, the assembly has to be pulled, rotated, or pounded loose and that is a major chore since the serrations dig into the tree. Next the drilled hole has to be plugged and redrilled, or the trunk cut off, redrilled and the rebar stand pounded back in. When it is time for the homeowner to remove the stand, that is a major problem. The task is so difficult that many just throw out the stand with the tree. That expense is not recoverable. The grommet could and would leak and the floor or carpet is ruined. Getting the residual water out of the bowl at the end of the season is very difficult and time consuming, one uses sponges and towels to soak up the water and rinse out same. The ends of the rebar dig into the floor or carpet and the owner must buy plastic caps to fit over the rebar ends. The stand cannot be conveniently moved and certainly not rotated without lifting up tree and stand.

The previous patent by Welzen used a sliding clip device to hold the nails, this device was not strong enough to withstand loads imposed on them when the tree was tipped to install. The stand used a one-piece blow molded container, which was expensive to manufacture, took up a lot of space and increased the cost of shipping and storage. With the exception of the previous patent by Welzen, all previous tree stands did not hold sufficient water to keep the tree green all season long to reduce the fire hazard. All are complicated with many manufactured detailed parts. They make it difficult to set up the tree and to take it down.

## **SUMMARY**

The present invention solves the problems mentioned above. The bottom of the tree does not have to be sawed straight. There are no holes that must be perfectly drilled into the bottom of the tree. It is easy to hammer a small spike through the guide of the base of the pot and into the base of the tree to keep the pot from skidding. It is simple to hammer in four nails, guided and held by two holes in the curved lip of the pot and into the trunk of the tree to hold the tree very securely to the pot. The tree lot personnel can do this set up work.

The customer takes home the tree and pot. The base is located on the floor where the tree should be set up. A large bowl, which holds 3 gallons of water, is placed on top of the base and the water poured in. A cover is placed over the bowl. The cover has a central hole to match the pot shape. The inner lip of this hole slopes down and inward to match the sides of the pot. The inward sloping lip acts as a guide to aid in inserting the tree with pot into the stand. Next the tree is made to stand straight by sliding the bowl, with its spherical lower surface on the spherical upper surface of the base to correct the slant of the tree trunk. At the end of the season, the tree and pot are lifted out, drip dried and taken out back to be discarded. The bowl, with residual water is easily picked up and poured into the toilet bowl, the sink, or tossed outside. The cover is placed on the bowl; the stand is then conveniently stowed by sliding all under the bed for use next year.

## **OBJECTS AND ADVANTAGES**

Besides the objects and advantages of the above mentioned inventions, several objects and advantages present are:

- (a) to provide a tree stand that is easy to set up and to stand straight;
- (b) to provide a tree stand that is easy to take down at the end of the season;
- (c) to provide a tree stand that holds sufficient water to last the entire season, thus keeping the tree green, which reduces the fire hazard;
- (d) to provide a bowl that is easy to empty at the end of the season;
- (e) to make it easy to install a pot to the base of the tree by using four nails;

- (f) to make it easy to keep the tree from sliding in the pot by means of a spike driven through the bottom of a pot guide and into the tree.
- (g) to make it easy to insert the tree into the stand by using a sloping downward rim around the hole opening of the cover that matches the pot sides, making it easier to guide and install the pot into the stand;
- (h) to have a raised ring around the bottom of the pot area to firmly keep the pot with tree, from sliding sideways;
- (i) to have an inwardly slanted ramp area at the top of the raised ring to engage the lower outer edge of the ~~pot~~<sup>BOWL</sup> to guide it into position, thus making it easier to install the tree where visibility to see the pot behind the branches is limited;
- (j) to design the parts so they can be easily vacuum formed from standard sheets;
- (k) to design the parts so they may also be injected molded using a suitable plastic such as HDPE.
- (l) to design the parts to be symmetrical about the center line for ease of manufacture;
- (m) to design in a suitable draft on all parts to allow the parts to be pulled easily from the vacuum form mold, or from the injection molded machine;
- (n) to design the pot to be injected molded to reduce piece price;
- (o) to design the upper lip of the pot so that it extends out and down to provide two guide holes to insert the nail to hold it true and steady when being pounded into the tree;
- (p) to design the ~~pot~~<sup>OUTER</sup> lower lip<sup>OF THE UPPER POT AREA</sup> to be positioned just a small clearance above the cover surface to keep the cover down in the event unusual circumstances want to lift the cover when the tree is attached;
- (q) to design the parts with sufficient draft so they can be readily stacked for minimum shipping volume, thus reducing the costs of the parts;
- (r) to design the tree stand to eliminate machined parts that are difficult to manufacture;
- (s) to design a tree stand that has no moving mechanical parts that can wear or break;

- (t) to provide a return lip around the bottom <sup>OUTER</sup> lip of the base so the tree with stand can be slid on the hard floor or carpet to a new location as desired;
- (u) to provide round parts to allow the tree to be rotated to install and remove decorations and lights and to show off the best branches;
- (v) to design the pot so that the nails see only side loads and no axial loads;
- (w) to design the pot so that at least two nails are resisting side loads at all times;
- (x) to use a spherical radius at the bowl bottom with a pivot one third of the way up on a tree. With a nine foot tree (108 inches), the spherical radius of the bowl is set at 36 inches with the matching spherical radius of the base being set at a smaller radius such as 34 inches or smaller from the identical above pivot point;
- (y) to provide a means of catching spilled water unto the base upper spherical shape and to the raised outer lip of the base.
- (z) to provide a ~~plastic~~ <sup>PREFERABLY PLASTIC,</sup> cloth to be placed on the floor upon which rests the base of the stand. To easily move the stand with tree installed, by gripping the edge of the cloth and pulling it in the direction that the stand must go. This cloth, preferably white in color can also be folded up around the base to disguise the stand.
- (aa) <sup>TO PROVIDE A</sup> ~~A~~ pot to hold the tree, which has a plurality of holes in the bottom to allow water to come up into the pot to water the tree. These same holes allow water to gush into the pot at the time the tree is inserted into the stand. At the end of the season, these holes allow the residual water to drain out feely as the tree is lifted out.

## DRAWING FIGURES

The invention is further described and functions noted and explained by the use of the following Figurative Drawings:

Fig 1 is an isometric view of the tree stand showing relative positions of the components of the assembly.

Fig 2 shows an exploded view of the components of the tree stand. The spike at the bottom of the pot is shown in the cross section of Fig 5, and Fig 6.

~~Fig 3 is a front view of the tree stand assembly.~~ OMIT

Fig 3 is a top view of the tree stand assembly. The cross section of the assembly is taken at Section line 4-4.

Fig 4 is the cross section showing the cross sectional of the assembly taken at Section 4-4.

Fig 5 is an enlarged view of the right half of the cross section. Note: revolving the cross section about the centerline generates all parts.

#### LIST OF REFERENCE NUMERALS

10 Assembly	28 tree cut slant	44 cover skirt
20 Tree	31 pot side	46 cover flange
22 Nail	32 dome top	51 raised ring
24 Spike	33 corner of pot	52 bowl flange
30 Pot	34 cylinder	53 ring ramp
40 Cover	36 guide hole	54 surface
50 Bowl	37 guide hole	56 corner
60 Base	38 top rim	62 surface
70 Sheet	39 lower lip	64 curved lip
26 tree cut	42 cover top	

#### DESCRIPTION AND OPERATION OF THE INVENTION

Refer to ~~Fig 5~~ <sup>FIG 4 AND FIG 5</sup>. The complete assembly 10 is shown with all components in their relative positions. The lower trunk of the tree 20 is shown in phantom. The end of the tree 20 is held from sliding sideways by the spike 24, which is driven through the extended cylindrical section 34 of the pot 30 and into the tree 20. The cylinder 34 locates the spike centrally and acts as a guide and holding device while the spike is inserted and driven



into the base of the tree. It is not necessary that the tree trunk be sawed off absolutely straight **26** since the dome shape **32** of the pot **30** allows for the insertion of a non-straight cut **28** of the tree.

The four nails **22** equally spaced radially on the pot **30** are driven into the tree trunk using guide holes **36, 37** to support the nails and allows the nails to be driven and positioned easily toward the center of the tree. The nails **22** are driven into the tree trunk just far enough, approximately one inch deep, to grip the tree firmly to resist side loads only. The nails **22** are located close to the upper rim **38** to allow the side loads on the nails to be easily transmitted to the upper rim, hence into the sloping sidewalls **31** of the pot **30**.

The lower outer rim **39** of the pot is designed with an approximate .032 clearance from the cover top **42** to act as a safeguard, should the cover for some reason try to lift up and out. The lower portion of the pot rim **39** prevents the cover from lifting up while the tree **20** is in the stand.

The loads transmitted to the sloping wall **31** are reacted by the sloping inward lower flange **44** of the cover **40**. The loads then travel to the cover top **42** opposite of the tree load **(P1)** and are introduced into outer downward outer sloping rim **52** of the bowl **50**. The load is then transmitted to the lower spherical surface **54** of the bowl **50** where it is introduced into the upper spherical surface **62** of the base **60**. The load then travels into the outer return lip **64** of the base **60** and is resisted by friction with the floor surface. The outer lip **64** also resists the downward weight of the tree and the water and transmits it to the floor surface in a downward direction. All this load transfer explanation is shown to illustrate why the component features are designed in the special manner in which they are.

If the tree **20** is accidentally tipped or tries to tip because of an unbalanced weight distribution of the tree **20**, the tip load is introduced into and pivots about the outer lower corner **56** of bowl **50** where the load is resisted by the upper spherical surface **62** of the base **60**.

The tipping load also pivots about the lower corner **33** of the pot **30**. This pivoting tipping load of the pot is resisted on the opposite side by the raised rim **51** of the bowl **50**.

The raised rim **51** has to be high enough to prevent the corner **33** of the pot **30** to slip out of the raised rim **51**.

When the tree **20** and pot **30** are introduced into the stand, the slope of inner downward lip **44** is deep enough to aid in guiding the pot **30** into the bowl **50** due to the matching angle of the sides. As the pot **30** approaches the bowl **50** bottom, it could be tilted slightly. If this is occurring, the bowl **50** has an inward slanting ramp **53** which contacts the lower rim **33** of the tipped pot **30** and directs it to slide down the ramp **53** and into the raised rim **51** where it is held snugly.

All components have sufficient draft to allow the parts to be stacked, thus saving shipping cost. The draft also allows the parts to be released easier from the injection molding machine and it also reduces wear on the tool surfaces.

## **RAMIFICATIONS OF INVENTION**

As heavier and larger trees are purchased, the tree stand may embody additional stiffening members to accommodate the larger, heavier trees. This can be accomplished by making the components thicker or by the addition of stiffening pillow ribs in the bottom of the bowl.

The parts can be injection molded where the part can be selectively made thicker and stronger in required areas. Gussets and ribs can be designed in to accommodate critically stressed sections of the design.

An alternate design of the bowl bottom, may be to segment the raised central bottom into quadrants with a half inch of space between the quadrants.

In lieu of nails, a long screw, slightly larger than the existing 20D 4 inch long nails may be used. The shank of the screw would have the same diameter as the nails and the end portion would be threaded for a one inch distance. The screw may have a flattened thumbscrew head, which could be used to pound in the screw to engage the threads and finish up by turning the threads for engagement;

In lieu of the spike, a regular plated screw of a one inch length with equivalent diameter as the nail may be used.

Note that the parts can be generated, by using one half of the cross section and rotating it around the centerline of the assembly.

An alternate approach to the spherical surface of the bowl is to use a flat bottom where only the end of the rim of the bowl slides on the spherical surface of the base.

An alternate approach to the base is to use members that would provide the benefit of a spherical surface. This would consist of components such as curved spokes-like tubing, or circular ringed tubing set to match a spherical surface level. These may be made of metal or plastic. Metal or plastic curved beams having the same radius of curvature as the spherical bottom may be used. The bowl could slide on these segments of a simulated spherical surface or any other portion of a spherical surface utilized.

## CLAIMS

What is claimed is:

**1. An adjustable stand assembly to mount a tree to stand upright in a vertical orientation.**

The stand assembly consists of:

a pot shaped member attached firmly to the base of a tree trunk;

a cover with a central opening for the pot member;

a bowl member that accepts the cover, holds 3 gallons of water and has a means of retaining the pot member;

a base member whose top has a downward concave surface which meets with the bowl bottom and has a return lip at the outer edge to facilitate moving the stand with tree;

a plastic or woven cloth sheet placed on the floor where the stand is to be set up, the base rests on this sheet and the tree assembly can be moved by pulling on the sheet;

**2. The stand assembly of claim 1.**

Wherein the pot member is attached firmly to the tree by means of a plurality of holding devices such as nails, screws, tapered bolts, pointed, or unpointed metal rods held and guided by two spaced holes; one in the outer downward lip of the pot top and the second hole through the sloping sides of the pot proper in line with the first hole and both aligned horizontally and pointing to the center of the pot.

The attachment to the tree can be aided by first drilling a small guide hole into the tree in line with the attachment. A benefit of drilling the hole is that it makes it easier to remove the attachments at the end of the season if one wants to save the bowl for other applications;

**3. The pot member of claim 2.**

Wherein the pot is circular in cross section making it possible to rotate the tree to show off best branches or to rotate the tree in setting up lights or ornaments and the removal of same at season's end;

**4. The pot member of claim 3.**

Wherein a plurality of holes are located at the outer bottom of the pot to allow water to enter the pot and tree and to drain the pot of water when the tree is lifted out to be discarded;

**5. The cover member of claim 1.**

Wherein the cover has a sloping upper surface to better resist side loads imposed by the pot when the tree is tipped. The cover has a down and outward slant to the lip to make it easier to install over the bowl. The lip of the cover has the function of transferring side loads to the bowl as well as acting as an enclosure cover;

**6. The cover member of claim 5.**

Wherein the cover central opening has a downward circular sloping surface to accommodate the circular and downward slope of the pot. This sloping surface guides the pot when it is placed into the stand. It holds the pot firmly and accepts side loads from the pot when the tree is tipped. This cover surface may have downward or raised indented pillow members impressed in the cover to further strengthen the cover and to provide a decorative pleasing design;

**7. The cover member of claim 6.**

Wherein the cover is circular in cross section to aid in manufacture. The circular center opening allows the rotation of the pot with tree;

**8. The bowl member of claim 1.**

Wherein the bowl is circular in cross section with an outer extended downward slope of the rim to match with the cover lip and to receive side loads from the cover. The side loads are re-acted by the lower surface of the bowl meeting with the corresponding lower base surface;

**9. The bowl member of claim 8.**

Wherein the center bottom of the bowl has a raised ring that matches and fits around the outer base of the pot. It holds the pot securely and reacts side loads that may be induced by tipping the tree;

**10. The bowl member of claim 9.**

Wherein the raised ring of the bowl bottom has an upper slanted down and inward sloping ramp surface. When the pot and tree are being installed in the stand, this ramp prevents the edge of the pot from getting hung up on the raised ring; it guides the pot to seat properly in the raised ring;

**11. The bowl member of claim 10.**

Wherein the lower surface of the bowl is convex spherical in nature and rests on a corresponding concave spherical surface of the base. The spherical radius center of the

bowl is set at the approximate center of gravity of a nine foot tall tree. This radius turns out to be 36 inches or a third of the way up from the end of the tree. This radius is always greater than the radius of the base.

**12. The bowl member of claim 11.**

Wherein the sloping wall of the bowl is slightly indented to mark the 3 gallon fill line of the bowl;

**13. The base member of claim 1.**

Wherein the upper surface of the base member is concave spherical in nature. The spherical radius is smaller than the radius of the bowl. This allows the outer rim of the bowl to contact first which introduces a stabilizing effect on the assembly, preventing the bowl from rocking on the base. This radius of curvature can be set at 34 inches or less;

**14. The base member of claim 13.**

Wherein the concave spherical surface extends out and beyond the spherical surface of the bowl. Since the bowl slides on the lower spherical surface to set the tree up straight, it is prudent to extend the base spherical surface to be able to maintain full contact with the entire spherical surface of the bowl;

**15. The base member of claim 14.**

Wherein the base has a sloping down and outward outer rim with a return lip. The object of the return lip is to allow the base with bowl, pot and tree to be able to slide along a floor or carpet top to reposition the location of the tree. The lip can also capture spilled water;

**16. The base sheet of claim 1.**

Wherein the base sheet is placed on the floor or carpet and the base located on top. The sheet enables one to slide the entire tree assembly to another desirable location by grasping the edges of the sheet and pulling to the new location. The base sheet, when spread out, also acts to catch any falling pine needles, broken ornaments and the like. The sheet may also be folded around the top of the stand to simulate snow and to hide the stand.

**17. The components of claim 1.**

Wherein the pot, cover, bowl, and base all have sufficient draft to allow each component to be stacked atop itself, reducing shipping volume and reducing the cost of shipping, storage and floor space.